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821 by the events narrated in the story of Lingutaimoa and her pet *manini* fish (1).

Seasons

821 The native Pukapukan year was divided into seasons (*vaia*). The sign 805 for the new year was the morning rising of the Pleiades, about the middle 132 of May. This ushered in a period of six moons of pleasuring, *ono maina* 221 *utuutu* (*utuutu* is a jumping game, and presumably the word is a symbol of good feelings engendered by sporting contests). Some informants dated this period from the rising of the Pleiades, others from the first new moon after the rising. Hence it comes between the May-June and October-November moons. The cool trade winds blow steadily from the southeast, deep-sea fish are plentiful, and the sea outside the reef in the lee of the atoll is always calm enough to render it possible to catch these fish. This season, though marked at times by a shortage of talo, is usually well provided with fish and nuts. It is the time for competitive sports, for deep-sea voyages, and for well-being. The period is introduced by feasting and dancing.

The six pleasure months are followed by six tapu moons (*ono maina ya*) from November to April. It is a period of heavy and changeable winds, possible hurricanes, excessive heat, and sultry weather. Deep-sea fish are not plentiful, and heavy seas sometimes make fishing arduous. Food comes from reef fishing and beach fishing for smaller fish. The supply of talo is plentiful if there has been no destruction of tubers during the preceding season. There was formerly little dancing, feasting, or chanting during this period, except at deaths. Compared with the moons of pleasure, these moons mark a time of stagnation of group activities, when only routine matters are kept in hand.

Another native classification gives three seasons, cutting across the dual division. The rainy season (*te vaia ya*), lasting from November to March, starts when the wind swings round from the south to the northwest and wild ducks are sighted flying southward. At this time the people of Yato village repair their houses and reroof them, because this village bears the brunt of the winds from the north and west. It is a season for good growth of trees, nuts, and talo; fishing is bad, but turtles come onto the outer beaches at the beginning of the period. The marine worm (*palolo*) is not known in Pukapuka so there is no *palolo* season to usher in this period. The season for fair weather (*te vaia lelei*) lasts from March to June when fishing is good and there is still much rain and plenty of food. The season of scarcity 221 (*te vaia to te onge*) lasts from July to October. There is little rain, the talo 312 turns yellow and does not produce tubers in any abundance. Growth of cocoanuts is marked by a midwinter pause; though not plentiful, they are generally sufficient for the needs of the population. Deep-sea fishing is good but water

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and taro are scarce. At the present time, the island water supply from concrete cisterns is rationed out to the families of the island from July until the first heavy rains.

The seasonal changes, though important for living conditions, have not involved any great seasonal rhythm of labor. Whereas house repairing for the western village is in October and November, that for the eastern village is in April and May, when the steady winds blow from the south and east. There is a tendency to reserve activities centered round the building of new houses and canoes for the cooler midyear months, and at the beginning of this period there is a spurt of building in all villages. Other activities go on throughout the year. Twice each year, depending on the maturity of the plants, all the taro beds on Wale and Motu Ko are fertilized. With the arrival of May and the beginning of the best deep-sea fishing, there is a general repairing of the fishing gear, including canoes, paddles, hooks, fishline, and anchor line. Today there is seasonal activity in copra making, the people from each village going to their respective reserves from March to April, and a second time from August to September.

Water

Water for domestic use was formerly obtained exclusively from seep holes and wells sunk close to the beach above high tide level. This slightly brackish water is still used for bathing and other purposes by all three villages when they visit their reserves and, owing to the distant location of a better supply, by most Yato villagers all the time. Today three concrete cisterns on Wale store water draining from the church and courthouse roofs. This water is used for drinking and washing in the rainy season, in the dry season for drinking only.

Plant Life

The soil of the whole atoll is poor, mostly infertile sand and coral gravel, and in consequence vegetation is sparse. Tropical bush grows luxuriantly in a few sections. Of the food plants, coconuts grow well, but taro and bananas grow only in excavated pits that have been filled with plant material and must be fertilized with leaves and ferns twice each year. As an aid to growth of bananas, old pieces of iron are buried among the roots. A few papaya and limes grow on Motu Kotawa. The kava plant (*Piper methysticum*) does not grow on the atoll. Specimens of all plants growing in Pukapuka, as identified by Marie C. Neal, E. H. Bryan, Jr., and F. Raymond Fosberg, are recorded in the following list:

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The boundaries between the lineage sections and between the homestead lots are well marked by stones, coconut and *pukamo* trees, and graves of ancestors. There is no record that a guard similar to the *pule* was used to protect these boundaries, which are nevertheless well known, well kept, and respected.

If a boundary tree dies or is blown down, another is immediately planted in its place and tended until it becomes an efficient boundary marker. People of the lot use only the trees growing on their own household lots for domestic purposes. If a nut drops from a tree growing on a homestead boundary and falls on the land of the next lot, it must be procured at once. If it is allowed to remain to grow into a tree across the boundary, the tree belongs to the man on whose land it grows. A person in theory has the right to keep nuts that have fallen on his property from trees growing across the boundary, but this is rarely done.

At the death of the household head, his house site and nut trees descend in the paternal line. The children of the deceased act as joint owners of the property through the trusteeship of the eldest male of the family. A man or a woman who may marry and live away from his or her paternal lot still has a claim to the nuts grown on the lot and expects to draw nuts from that lot in an emergency. Children of a man residing matrilocally retain an interest in their father's paternal lands. Children do not normally inherit coconut trees from their mother. According to Mīmoa, it was formerly the custom to divide coconut trees among men, giving them to women only when there were no sons in the family, but the custom today is to share coconut trees among both sons and daughters so that none will ever be deprived of nuts.

In former days, a well was sunk on each homestead lot for the use of the households living on the lot. Three lots in Yato still have their own wells, each used by the people of the lot. Others may draw water from these wells, but through courtesy right only, I think. If the water level in the well is low, outsiders drawing water are regarded with a somewhat unfriendly eye.

No story or legend is remembered which relates how the lineage sections or lots were originally formed. Pau believes that the paternal lineages of Ngake held *tutuki* contests at various times to settle boundaries, and cites as evidence the very irregular boundary lines. Loto informants have no memory of *tutuki* for the Loto sections, and add: "The Loto sections are so small and short, running across Wale as they do at its narrowest part, that they would not be worth quarreling about—the gain to one paternal group at the expense of the other would be so slight."

As a matter of speculation, it is likely that originally the people of the same paternal lineage congregated together on the same piece of land. Cemeteries would be placed there and boundaries marked off. Thus sections of land would come to be associated with certain lineages. But through patrilocal marital residence and personal choice,

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for a type Rakahangan house, save that the Pukapukan commencement differs slightly from the Rakahangan technique. The Pukapukan lashing is shown in figure 9. This lashing is extremely common in Pukapuka on both houses and canoes, and is the only lashing used when it is necessary to fasten together securely two crossing elements.

Thatching

All houses in former days were thatched (*ato*) with coconut roof sheets (*pola lauuiu*). The method of plaiting the double coconut sheet is that described by Buck (26, pp. 7-11, figs. 6-10) for Aitutaki. Before being made into roof sheets the coconut leaf midribs are soaked in salt water for a few hours to free them of insects. The roof sheets are attached to the rafters by a continuous two-ply twisted sennit cord (*uka*); the method of passing the cord through the sheets from the inside of the house and back from the outside is that described for Aitutaki (26, pp. 19-21, figs. 23-25). A special thatching needle (*yuki*) is used in Pukapuka, however, to facilitate this work. Two methods are distinguished by which the sheets may be applied to the rafters:

In one method (*ato yinahi lau*), the sheet midribs are all of the same length. They are applied in courses running from eaves to ridgepole, the midribs about one inch apart, contiguous courses overlapping. In the second method (*ato tele*) some roof sheets are made with short, some with long, midribs. Long midribs (*ai pola*) alternate in each course with short midribs (*ga pola*) and the sections running from eaves to ridgepole are not darkened as in the *ato yinahi lau* method. The *ato tele* method of applying the sheets is more laborious than the *ato yinahi* method, but a well-thatched roof of this type is more nearly waterproof and lasts up to 10 years, whereas an *ato yinahi* roof, though more easily and quickly applied, rarely lasts longer than four to five years.

In thatching a roof section, a long doubled sheet (*pola tamatai*) is placed on the rafters above the eaves. A long sheet is placed on top of this and the lashing to the rafters commences. Short sheets alternate with long sheets. As the thatching advances up the side of the roof, a worker lifts up the roof sheets to those who are lashing from the inside by supporting them with a lifting pole (*tuku pola*), which has the customary shoulder point. In both methods of thatching it is arranged that the last sheet to be applied to the sides is a long one. On top of this and overlapping the ridgepole break (*ati*) between the thatchings of the two sides is placed another sheet (*pola ati*), covered by still another sheet (*pola tapatapa*). Over all is placed a coconut ridging mat (*tahipau tapatapa*), made of two split half leaves and one whole leaf as described for Aitutaki (26, pp. 24-28, figs. 28-34). The gable ends are thatched in the same manner, starting from the double sheet at the eaves and working up to the ridgepole. The sheets are shortened as the thatching comes close to the ridgepole. At the top a small space is usually left for ventilation, and at the sides the edges of end sheets are often wedged in between the sheets that form the side thatching. Some leave the overhanging sheets at the eaves ragged and irregular, but others carefully trim the eaves edge of the sheets in an even line (*hoehoei te pukutuku uaua*).

When heavy winds are expected, the thatching of coconut-leaf sheets is reenforced by knotting together the tip ends of two coconut midribs, which are then slung over the roof thatching in such a way that one midrib falls

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Wells

312 332 335 Deep wells dug close to the beach were always faced with coral slabs. Shallow wells, 1 or 2 feet deep, were not faced unless they were in constant use. Slabs at the bottom of the well were stood on edge and forced into the sand; the sand was dug out inside these upright slabs and the bottom of the well paved with coral gravel. Above water level, the sides of the well were faced with horizontal slabs set one above the other. The edge of the well at ground level was faced with especially large blocks of stone to give a firm foothold to the drawer of water and to ensure that the top of the well would not cave in.

226 Figure 20.—Plan of fishweirs. *a*, stone-walled fishweir off western beach of Yato village: walls about 20 feet long, width of three weirs about 60 feet; fish swept into weirs by ebbing tide moving in direction of arrow. *b*, composite weir in lagoon indentation: 1, causeway forms one wall of weir; 2, row of stones set against causeway to block possible channels; 3, row of stones forming second wall of exit (a/s ika); 4, coconut-leaf weir forms second wall of weir; set placed at convergence of leaf and stone walls to catch fish moving with ebbing tide in direction of arrow.

Fishweirs

Stone fishweirs are found in the reef shallows opposite the northwest beach of Wale, between the beach and the reef passage. One weir is about 100 yards from the beach and consists of stones piled in line to make an enlarged W-shape; the second weir is close to the beach and consists of stones forming a W-shaped trap contiguous with a second trap in the shape of a large square-bottomed U (fig.20,*a*). The weirs face north and south; the exits are at the northern end, that is, at the points of the W and at the two sides of the bottom of the U. The ebbing tide sweeps through the weirs on its way out over the reef and carries the fish along into the weirs blocked with hand scoop nets.

A combination stone and coconut-sweep weir (fig. 20,*b*) is built in the small lagoon indentation cut off from the main lagoon by the causeway that joins the two sections of Yato village. The fisherman seated on the causeway is able to block the exit of the weir with a scoop net.

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ment end, and passes at 6, on near side, diagonally up to shoulder (3) where it grips poll of adz, passes across far side of heel, and is brought to near side over notch 1, across to toe angle; it makes a turn under toe angle, passes to notch 1, on far side, and then across heel on near side, gripping first diagonal turn (7) of sennit from toe to heel. *b*, continuation of lashing: free end (7) passes across shoulder (3) and across heel to notch 1, where it is brought across to near side and down (8) to near side toe angle; from toe angle it passes to far side of toe and makes a transverse turn around toe, coming back on near side and passing under toe angle (9) to make diagonal turn on far side up to shoulder; brought around shoulder to near side and passes across heel (10) to notch 1, where it passes down far side of heel to make further turns, as described, until four complete turns are made of which, for clearness, only two are shown in *b*. *c*, lashing of point of heel: fourth completed turn brings free end of sennit into position at 11, to make two turns around point of heel; sennit passes diagonally across near side of foot from toe angle to heel, crosses to far side of heel at notch 2, passes across heel and is brought to near side of heel (12) and diagonally down on near side to toe angle; sennit crosses under toe again (13), runs diagonally up to heel on far side and is brought across notch 2, to near side of heel, then across heel and diagonally down on far side to toe angle (14); sennit then ready to make two more turns, repeating diagonal movements between toe angle and heel; four diagonal turns in all, of which only two are shown in *c*. *d*, continuation of lashing: last turn of diagonal lashing brings sennit into position (15) for further turns; sennit passes on near side from toe angle to notch 1, where it lies on top of turns made as in *b*; sennit crosses to far side of heel, then crosses heel to shoulder (3) and goes around to near side of heel and across heel to notch 1 where it passes to far side of heel and down to toe angle (17), forming lower loop (16) of this phase of lashing. *e*, sennit (17) comes around under toe angle and goes diagonally across to heel; turn continued around heel to far side to make upper loop (18), then diagonally down on far side to toe angle; this brings sennit (19) into position to repeat turns as in *d* and *e*; altogether six turns are made, lower loop alternating with upper loop, and free finishing end of sennit brought up on near side of toe angle and buried underneath last two turns at heel angle. *f*, completed lashing: 20, first four turns made around toe, binding lower part of adz to toe of haft; 21, four diagonal turns around point of heel and notch 2; 22, final six turns, alternating lower with upper loop; 23, point where end is buried to complete lashing.

Drill

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The pump drill (**sees**) was formerly used to drill holes in wood and shell. It was of a common Polynesian design (fig. 22).

To drill a small hole or to drill fragile articles, a light balance was required; for this purpose one half of a dry coconut shell was put on the shaft by pushing the shaft through the soft eye of the shell, the eye part of the shell pointing downward, the open half of the shell pointing upward. To drill a large hole in hard material, a heavy balance was used, the wooden balance on a drill being reenforced if necessary with extra weights of wood.

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The point of the drill was of shell or iron. Informants were at pains to point out that the Pukapukans were aware of iron long before white contact. They procured nails from pieces of boat wreckage which from time immemorial have drifted onto the outer beaches. They burned the wreckage and combed over the ashes for nails hammered into the wood.

To drill is also **sees**. The worker started a hole by holding the shaft of the drill between the palms of the hands and rotating it. When he had made the slightest depression to hold the point, he worked the drill with the pump handle.